

I CLAIM:

1 1. A well kill additive comprising a dry mixture of a  
2 water soluble crosslinkable polymer, a crosslinking  
3 agent, and a reinforcing material selected from among  
4 fibers and comminuted plant materials.

1 2. The additive of claim 1 wherein the polymer is an a  
2 carboxylate-containing polymer and the crosslinking agent  
3 is a chromic carboxylate complex.

1 3. The additive of claim 2 wherein the reinforcing  
2 material comprises hydrophilic and hydrophobic fibers.

1 4. The additive of claim 3 wherein the hydrophobic  
2 fibers comprise at least one selected from the group of  
3 hydrophobic fibers consisting essentially of nylon,  
4 rayon, and hydrocarbon fibers, and wherein the  
5 hydrophilic fibers comprise at least one selected from  
6 the group of hydrophilic fibers consisting essentially of

*pub  
B2 cat 1's*  
glass, cellulose, carbon, silicon, graphite, calcined  
petroleum coke, and cotton fibers.

1 5. The additive of claim 2 wherein the reinforcing  
2 material comprises comminuted plant material.

*pub  
B2 cat 1's*  
1 6. The additive of claim 5 wherein the reinforcing  
2 material comprises at least one comminuted material  
3 selected from the group of comminuted plant materials  
4 consisting essentially of nut and seed shells or hulls of  
5 almond, brazil, cocoa bean, coconut, cotton, flax, grass,  
6 linseed, maize, millet, oat, peach, peanut, rice, rye,  
7 soybean, sunflower, walnut, and wheat; rice tips; rice  
8 straw; rice bran; crude pectate pulp; peat moss fibers;  
9 flax; cotton; cotton linters; wool; sugar cane; paper;  
10 bagasse; bamboo; corn stalks; sawdust; wood; bark; straw;  
11 cork; dehydrated vegetable matter; whole ground corn  
12 cobs; corn cob light density pith core; corn cob ground  
13 woody ring portion; corn cob chaff portion; cotton seed  
14 stems; flax stems; wheat stems; sunflower seed stems;

15 soybean stems; maize stems; rye grass stems; millet  
16 stems; and mixtures thereof.

1 7. The additive of claim 2 wherein the polymer is a  
2 partially hydrolyzed polyacrylamide.

1 8. The additive of claim 7 wherein the reinforcing  
2 material is a comminuted material selected from among  
3 comminuted materials derived from peanuts, wood, paper  
4 any portion of rice seed or plant, any portion of corn  
5 cobs, and mixtures thereof.

1 9. The additive of claim 8 wherein the additive further  
2 includes cellophane, and wherein the reinforcing material  
3 is a comminuted material selected from among mixtures of  
4 comminuted rice fraction and peanut hulls; mixtures of  
5 comminuted rice fraction, and wood fiber or almond hulls;  
6 mixtures of comminuted rice fraction and corn cob  
7 fraction; and mixtures of comminuted rice fraction and  
8 corn cob fraction and at least one of wood fiber, nut  
9 shells, and paper.

1 10. The additive of claim 9 wherein the reinforcing  
2 material comprises comminuted mixture of rice fraction,  
3 corn cob pith and chaff, cedar fiber, nut shells, and  
4 paper.

1 11. A method of forming a well kill fluid comprising:  
2 (a) providing a well kill additive comprising a dry  
3 mixture of water soluble crosslinkable polymer, a  
4 crosslinking agent, and a reinforcing material selected  
5 from among fibers and comminuted plant materials; and  
6 (b) contacting the well kill additive with water or  
7 an aqueous solution to form the well kill fluid.

1 12. The method of claim 11 wherein the polymer is a  
2 partially hydrolyzed polyacrylamide, the crosslinking  
3 agent is a chromic carboxylate complex, wherein the  
4 additive further includes cellophane, and wherein the  
5 reinforcing material is a comminuted material selected  
6 from among mixtures of comminuted rice fraction and  
7 peanut hulls; mixtures of comminuted rice fraction, and

8 wood fiber or almond hulls; mixtures of comminuted rice  
9 fraction and corn cob fraction; and mixtures of  
10 comminuted rice fraction and corn cob fraction and at  
11 least one of wood fiber, nut shells, and paper.

1 13. The additive of claim 12 wherein the reinforcing  
2 material comprises comminuted mixture of rice fraction,  
3 corn cob pith and chaff, cedar fiber, nut shells, and  
4 paper.

1 14. A method of killing a well to substantially reduce  
2 volumetric flow of a formation fluid across a wellbore  
3 face into a wellbore penetrating a formation having a  
4 formation matrix and containing said formation fluid  
5 below an earthen surface, comprising:

6 (a) providing a well kill additive comprising a dry  
7 mixture of water soluble crosslinkable polymer, a  
8 crosslinking agent, and a reinforcing material selected  
9 from among fibers and comminuted plant materials;

(b) contacting said additive with water to form a well kill fluid;

(c) placing said well kill fluid in said wellbore at said wellbore face, wherein said fluid which is placed at said wellbore face does not significantly penetrate the formation matrix;

(d) forming a nonflowing fluid from said well kill fluid in said wellbore at said wellbore face to substantially reduce said volumetric flow of said formation fluid across said wellbore face into said wellbore, thereby killing said well; and

(e) removing substantially all of said nonflowing fluid from said wellbore face to substantially restore the volumetric flow of said formation fluid into said wellbore.

15. The method of claim 14 wherein the polymer is an a carboxylate-containing polymer and the crosslinking agent is a chromic carboxylate complex.

16. The method of claim 15 wherein the reinforcing material comprises hydrophilic and hydrophobic fibers.

1 17. The method of claim 16 wherein the hydrophobic  
2 fibers comprise at least one selected from the group of  
3 hydrophobic fibers consisting essentially of nylon,  
4 rayon, and hydrocarbon fibers, and wherein the  
5 hydrophilic fibers comprise at least one selected from  
6 the group of hydrophilic fibers consisting essentially of  
7 glass, cellulose, carbon, silicon, graphite, calcined  
8 petroleum coke, and cotton fibers.

1 18. The method of claim 15 wherein the reinforcing  
2 material comprises comminuted plant material.

1 19. The method of claim 18 wherein the reinforcing  
2 material comprises at least one comminuted material  
3 selected from the group of comminuted plant materials  
4 consisting essentially of nut and seed shells or hulls of  
5 almond, brazil, cocoa bean, coconut, cotton, flax, grass,  
6 linseed, maize, millet, oat, peach, peanut, rice, rye,  
7 soybean, sunflower, walnut, and wheat; rice tips; rice  
8 straw; rice bran; crude pectate pulp; peat moss fibers;

9 flax; cotton; cotton linters; wool; sugar cane; paper;  
10 bagasse; bamboo; corn stalks; sawdust; wood; bark; straw;  
11 cork; dehydrated vegetable matter; whole ground corn  
12 cobs; corn cob light density pith core; corn cob ground  
13 woody ring portion; corn cob chaff portion; cotton seed  
14 stems; flax stems; wheat stems; sunflower seed stems;  
15 soybean stems; maize stems; rye grass stems; millet  
16 stems; and mixtures thereof.

1 20. The method of claim 15 wherein the polymer is a  
2 partially hydrolyzed polyacrylamide.

1 21. The method of claim 20 wherein the reinforcing  
2 material is a comminuted material selected from among  
3 comminuted materials derived from peanuts, wood, paper  
4 any portion of rice seed or plant, any portion of corn  
5 cobs, and mixtures thereof.

1 22. The method of claim 21 wherein the additive further  
2 includes cellophane, and wherein the reinforcing material  
3 is a comminuted material selected from among mixtures of



4 ~~comminuted rice fraction and peanut hulls; mixtures of~~  
5 comminuted rice fraction, and wood fiber or almond hulls;  
6 mixtures of comminuted rice fraction and corn cob  
7 fraction; and mixtures of comminuted rice fraction and  
8 corn cob fraction and at least one of wood fiber, nut  
9 shells, and paper.

1 23. The method of claim 22 wherein the reinforcing  
2 material comprises comminuted mixture of rice fraction,  
3 corn cob pith and chaff, cedar fiber, nut shells, and  
4 paper.

1 24. A method for reducing volumetric flow of a formation  
2 fluid across a wellbore face into a wellbore penetrating  
3 a formation having a formation matrix and containing said  
4 formation fluid below an earthen surface, comprising::

5 (a) providing a well kill fluid comprising an  
6 aqueous solution of water soluble crosslinkable polymer,  
7 a crosslinking agent, and a reinforcing material selected  
8 from among fibers and comminuted plant materials;

(b) placing said well kill fluid in said wellbore at said wellbore face, wherein said fluid which is placed at said wellbore face does not significantly penetrate the formation matrix;

(c) forming a nonflowing fluid from said well kill fluid in said wellbore at said wellbore face to substantially reduce said volumetric flow of said formation fluid across said wellbore face into said wellbore, thereby killing said well; and

(d) removing substantially all of said nonflowing fluid from said wellbore face to substantially restore the volumetric flow of said formation fluid into said wellbore.

25. The method of claim 24 wherein the polymer is an a carboxylate-containing polymer and the crosslinking agent is a chromic carboxylate complex.

26. The method of claim 25 wherein the reinforcing material comprises hydrophilic and hydrophobic fibers.

1 27. The method of claim 26 wherein the hydrophobic  
2 fibers comprise at least one selected from the group of  
3 hydrophobic fibers consisting essentially of nylon,  
4 rayon, and hydrocarbon fibers, and wherein the  
5 hydrophilic fibers comprise at least one selected from  
6 the group of hydrophilic fibers consisting essentially of  
7 glass, cellulose, carbon, silicon, graphite, calcined  
8 petroleum coke, and cotton fibers.

1 28. The method of claim 25 wherein the reinforcing  
2 material comprises comminuted plant material.

1 29. The method of claim 28 wherein the reinforcing  
2 material comprises at least one comminuted material  
3 selected from the group of comminuted plant materials  
4 consisting essentially of nut and seed shells or hulls of  
5 almond, brazil, cocoa bean, coconut, cotton, flax, grass,  
6 linseed, maize, millet, oat, peach, peanut, rice, rye,  
7 soybean, sunflower, walnut, and wheat; rice tips; rice  
8 straw; rice bran; crude pectate pulp; peat moss fibers;  
9 flax; cotton; cotton linters; wool; sugar cane; paper;

10 bagasse; bamboo; corn stalks; sawdust; wood; bark; straw;  
11 cork; dehydrated vegetable matter; whole ground corn  
12 cobs; corn cob light density pith core; corn cob ground  
13 woody ring portion; corn cob chaff portion; cotton seed  
14 stems; flax stems; wheat stems; sunflower seed stems;  
15 soybean stems; maize stems; rye grass stems; millet  
16 stems; and mixtures thereof.

1 30. The method of claim 25 wherein the polymer is a  
2 partially hydrolyzed polyacrylamide.

1 31. The method of claim 30 wherein the reinforcing  
2 material is a comminuted material selected from among  
3 comminuted materials derived from peanuts, wood, paper  
4 any portion of rice seed or plant, any portion of corn  
5 cobs, and mixtures thereof.

1 32. The method of claim 31 wherein the additive further  
2 includes cellophane, and wherein the reinforcing material  
3 is a comminuted material selected from among mixtures of  
4 ~~comminuted rice fraction and peanut~~ hulls; mixtures of

5 comminuted rice fraction, and wood fiber or almond hulls;  
6 mixtures of comminuted rice fraction and corn cob  
7 fraction; and mixtures of comminuted rice fraction and  
8 corn cob fraction and at least one of wood fiber, nut  
9 shells, and paper.

1 33. The method of claim 32 wherein the reinforcing  
2 material comprises comminuted mixture of rice fraction,  
3 corn cob pith and chaff, cedar fiber, nut shells, and  
4 paper.